



Mississippi National River
and Recreation Area



Wilderness
Inquiry

Urban Wilderness Canoe Adventures (UWCA)

Mississippi River Gorge Field Trip

Route: East River Flats (U of M, Minneapolis) to Hidden Falls Park (Saint Paul)

Suggested Grade Level: 6th

Timeframe: 4½ hours

Distance: Approximately 5.5 mi.

Trip Theme: Geological and human forces have shaped and continue to shape the river of today.

Key Learning Objectives:

The student will view and be able to describe evidence of geological time.

The student will observe and describe examples of human activities (including engineered systems such as storm drains and dams) that have impacted the river environment.

Overview of Field Experience:

Students canoe 5.5 miles down the Mississippi River Gorge, a unique geologic reach on the river created over a period of 10,000 years by the recession of St. Anthony Falls. They will observe geological strata along river bluffs formed by sedimentary deposits dating from 460-455 million years ago, when this land was covered by a tropical sea.

The route will pass under several bridges, numerous storm sewer outlets, many navigational markers, and the ruins of the first lock and dam on the Mississippi River (Meeker Island Lock & Dam), which functioned only five years before being substantially demolished. Meeker Lock & Dam was replaced by Lock & Dam #1, site of a hydropower station that provides power for the Ford Assembly Plant.

We will make a short stop for students to sketch a bridge or other engineered structure (they will construct a model bridge in the classroom). A lunch break near Lake Street Bridge is included in the middle of the trip. Our trip will include a lockage at Lock #1, which slowly lowers our canoes 35 feet around the Ford Dam, before we continue past the mouth of Minnehaha Creek to Hidden Falls Park.



Minnesota Academic Standards (Science, Language Arts, and Social Studies):
The field trip will either address or enable classroom involvement with the following standards.

Science:

- 5.1.3.4 Tools and mathematics help scientists and engineers... (Use graphs and maps.)
- 5.3.1.2 The surface of the Earth changes... (Explain how rocks weather to form soil, and erosion forms features of the Earth's surface.)
- 5.3.4.1 In order to maintain and improve their existence, humans interact with and influence Earth systems. (Identify renewable energy resources; compare the impact of individual decisions on natural systems.)
- 5.4.4.1 Humans change environments in ways that can be either beneficial or harmful... (Give examples of beneficial and harmful interaction with natural systems.)
- 6.1.2.1 Engineers create... structures, processes and systems that impact society... (Identify a common engineered system and evaluate...; recognize that there is no perfect design, and technologies have consequences; explain the importance of learning from past failures...)
- 6.1.3.1 Designed and natural systems exist and consist of components... (Describe a system in terms of its parts, inputs and outputs.)
- 6.2.2.1 Motion of an object can be described in terms of speed, direction & change... (Measure and calculate speed.)
- 6.2.2.2 Forces have magnitude and direction and govern motion of objects. (Recognize balanced and unbalanced forces acting on an object...)
- 6.2.3.1 Waves involve transfer of energy... (Describe properties of waves including speed, wavelength, frequency and amplitude.)
- 6.2.3.2 Energy can be transformed... (Trace the changes of energy forms including mechanical and electrical.)

Language Arts (II. Writing):

- Compose various pieces of writing (write in a variety of modes to express meaning)
- Engage in writing process with attention to organization, focus, quality of ideas, audience and purpose.

Social Studies (V. Geography):

- Identify major physical and cultural features... in the history of Minnesota (locate MN ecosystems, topographic features, river valleys, cities)
- Make and use maps... (create a variety of maps too scale)
- Give examples of how people are connected to each other and the environment (analyze how physical environment influences human activities)

Recommended Classroom Activities:

Journaling Project

Students will make a journal in class before the trip. On the front cover, they will create a collage of their impressions of river nature or what they expect to see on the trip. Collage materials will be supplied by UWCA. The journals will then be used to take notes about their experiences on the trip. Students will be asked to answer the following open-ended question related their river impressions/experiences:

6th Grade Grade Mississippi River Gorge: *How has this part of the river changed over the last 12,000 years?*



The students will write their responses in their journals before the trip. Bring journals and supplies along on the trip so that students may write notes or draw pictures. They may finish their writing in a trip follow-up session in class. The intent of this journaling exercise is to allow students to “Live Inside the Questions”, and to analyze what they have learned.

In a follow-up class session, students will complete the back covers of their journals by doing another collage of their post-trip impression. Students may use the materials provided by the UWCA or draw their own images.

Pre-trip Classroom Activities

(See <http://www.nps.gov/miss/forteachers/teacherresources.htm> or as noted.)

- Waterfall on the Move (three parts – describing the geological origins of the gorge; employing science, math and geography)
 - Mississippi River Bluff Strata
 - St. Anthony Falls: 1680-1876
 - Map the Mississippi in the Twin Cities (use resource, “Journey of a Waterfall”)
- Sedimentary Layers
- Fossils
- Urban Water Cycle Interactive (online at <http://www.health.state.mn.us/water/urbancycle/>)
- Through Interactive (on-line interactive demonstrates how a lock works)
- Vocabulary (sections on geology and navigation, locks, dams, and bridges)

Post-trip Classroom Activities

(bridge activity and poetry online at

<http://www.nps.gov/miss/forteachers/teacherresources.htm>)

- Bridge Span Activity (build a model bridge from simple materials)
- Poetry (see four forms of poetry to make a poem about your river trip)
- Journal writing (do writing before and after field trip about what know, what you want to learn, and what you did learn about the Mississippi River)
- Art (make a picture to express what you saw or learned on your river trip)
- Map your local watershed (research your local watershed and make a map that shows how water runs from your school to the Mississippi River)
- Non-point source pollution activity, or “Adopt-a-River Virtual Watershed,” or “Enviroscape” (model to demonstrate water pollution and how to prevent it – may be checked out from National Park Service via Brian at 651-290-3030, x303)

Detailed Route Description and Trip Activities:

Start: The trip will convene at the East River Flats near the U of M Boathouse. Orientation to safety, canoeing, and day’s activities will be provided. Emphasis is



placed on trip as a “Leave No Trace” experience. Boat assignments are made. Boat captains (sterners) or pod leaders provide introduction to route activities, including understanding the river gorge, geological time and waterfall recession, and looking for evidence of human impacts. Such impacts may include not only changes to the river itself (once a rapids, and now impounded by a dam), but also connections to the river through urban systems that manage human waste and drainage of streets.

Students should find and be able to describe:

1. A place where water drains into the river. (Where does the water come from?)
2. A built structure along the river that is unique.
3. Evidence of something that happened more than one hundred years ago (human or natural).

Once on the river, we'll look at engineered structures and paddle past a variety of bridges (present and past remnants), storm drain outfalls, and the ruins of the first lock & dam on the river where a brief interpretive stop will be made (boat captain or pod leader will interpret site). Time and weather permitting, we will make a short stop for students to view two different bridges, and make a sketch of a bridge, before proceeding to the lunch stop.

Lunch: A break will be taken near Lake Street Bridge (West River Sand Flats, .5 miles past Lake Street), where port-a-potties will be available nearby (from sand flats, port-a-potties would be at top of high bluff staircase, and staff will take small groups up there during lunch break, a 15-20 minute round trip).

Following lunch we will pick up any litter and waste, then gather by pod (or by boat) to review what students found on first section. Based on what they have found, how can the river become polluted? How have humans and human-made systems impacted the river? (Consider storm drains, barge channel, etc.) Have the changes been good or bad for the river and the life that depends on it? Then we'll look at surrounding features including the site of St. Anthony Falls 5,000 years ago, and engineered structures – such as bridges. We'll preview the route ahead, which includes Lock & Dam #1, and the adjoining hydropower station.

After lunch: We'll continue to look at geology and human-made systems. We'll approach Lock #1 at river right just past the Ford Bridge, and wait for lockage signal light to turn green before entering the lock. Departing the lock, we'll have a chance to look back at the dam from below, pass the mouth of Minnehaha Creek where people often fish, and look for our landing spot at Hidden Falls Park just downstream on river left.

Finish: We will work together to move canoes and gear off the river. Next, we'll gather all together to share final reflections on the day's paddling, and what we've experienced. What did we see and learn about engineered structures/systems?



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What will we remember about this river, its natural life and human history? Why should we care about it? What did we learn about ourselves?

Buses will pick up groups at this landing site at the designated times. If personal vehicles have been left at the launch site, teachers will have to make special arrangements to pick them up.